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ABSTRACT

This is an evaluation report on a Title I nonpublic school corrective mathematics program conducted in New York City in 1979-1980. Chapter I provides a description of the program and its goals. In chapter two the objectives and tests used are outlined by grade, and information is given on the analysis of evaluation results. The third chapter contains a summary of the survey data and teacher interviews, including: (1) information about the teacher respondents: (2) a pupil profile: (3) information on teaching methods used: (4) a description of support services: (5) a report on the extent of parent contact with teachers: and (6) recommendations for improvement in these areas. Chapter four presents a classroom observation summary describing classroom organization and activities. The fifth chapter contains a summary of interviews with the program's coordinator and field supervisor. Student evaluation procedures, personnel considerations, program organization, and instructional approaches are reviewed. The last chapter summarizes the program's effect on student mathematics scores and lists recommendations for program improvement. (APM)

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FINAL EVALUATION REPORT

ESEA Title 1

Project Identification Number: 5001-64-01624

ESEA TITLE I
NONPUBLIC SCHOOL PROGRAM
CORRECTIVE MATHEMATICS SERVICES
1979-1980

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I. PROGRAM DESCRIPTION

The Title I Nonpublic Schools Corrective Mathematics Services Program, hereafter called the Corrective Mathematics Program, served 8,547 nonpublic school students in grades 1 through 11 at 167 sites. Participating students were Title I eligible and required remediation in mathematics (six or more months below grade level). The goals of the program were: (1) to develop pupils' readiness for mathematics learning, (2) to improve pupils' development of mathematical concepts and (3) to increase pupils' achievement in computational and problem solving skills.

Instruction was given in small groups of five to ten students. Each group met two to five times per week for 35 to 60 minutes per session. Emphasis was placed on developmental and discovery techniques. The program provided reference materials, measurement materials, standardized tests, pupil workbooks and audio-visual materials.

The staff included one full-time equivalent (FTE)* coordinator, four FTE field supervisors, 87.4 FTE teachers and three FTE secretaries and/or clerks.

*FTE: Full-time equivalent; one FTE is equivalent to one full-time staff postion. Some teachers in the program are hired on a part-time or per diem basis; therefore, the amount of teaching service is expressed in FTE's in lieu of reporting the number of teachers employed.

II. DATA ANALYSIS

Objectives And Tests Used

Grade 1. Students were to achieve gains in performance in mathematical concepts, as measured by the Stanford Early School Achievement Test, Level II, greater than would have been expected in the absence of treatment.

USOE Evaluation Model A1 was used to derive the "no-treatment expectation." Pretest raw scores were converted to Normal Curve Equivalents (NCE's), a type of score which expresses performance in relation to the performance of a nationally representative sample of students. Posttest scores were also converted to NCE's. It was assumed that, in the absence of treatment, the mean NCE of the group would be the same at posttest as at pretest.

An increase in mean NCE was interpreted as a gain in performance beyond what would have been expected without treatment.

Grade 2-11. Students were to achieve gains in mathematical computation, concepts, and problem solving, greater than would have been expected in the absence of treatment. These skills were measured by the Total Mathematics Score on the Stanford Achievement Test for Grades 2-8 and by the Total Mathematics score on the Stanford Test of Academic Skills (TASK) for Grades 9-11. USOE Model A1 was used, as above, to derive the "no-treatment expectation." A gain in mean NCE from pretest to posttest was interpreted as a gain in performance attributable to the program.

CHART I

TEST LEVELS AND FORMS, BY GRADE
FOR CORRECTIVE MATHEMATICS PROGRAM

GRADES	TEST LEVELS
Grade 1	SESAT, Level II
Grade 2	SAT, PRIMARY 1, Form A
Grade 3	SAT, PRIMARY 2, Form A
Grade 4	SAT, PRIMARY 3, Form A
Grade 5	SAT, INTERMEDIATE 1, Form A
Grade 6	SAT, INTERMEDIATE 2, Form A
Grade 7-8	SAT, ADVANCED, Form A
Grades 9,10,11	TASK, 1 Form A*
Grade 12	TASK, 2 Form A

*Although Level II was specified in the evaluation design, Grade 11 students were actually tested with TASK, Level I. Eleventh grade norms are unavailable for Level I, so that results are not reported for this grade.

Report and Analysis of Evaluation Results

According to the records kept, 8,547 students were served by the program. This evaluation reports on 7,896 students for whom both pre- and post-test data are available. Students were eliminated from analysis because of errors in data transcription, or because appropriate norms were unavailable. For example, all 11th graders in the program were tested with TASK Level I instead of Level II. While this test may have been more appropriate to their instructional level, NCE's have not been produced for 11th graders on this test and the data were not analyzed.

As the following table indicates, the program objectives were met in all eleven grades reported. Performance improvement is particularly striking in grade 1, where there was a mean NCE gain of 24. In grades 2 through 7, where program enrollment is concentrated, mean NCE gains ranged from six to nine.

Correlated t-tests were performed on the raw scores and NCE's for grades 1 through 10 and 12. All gains were statistically significant beyond the .001 level.

CHART II

MATHEMATICS ACHIEVEMENT SCORES FOR STUDENTS IN CORRECTIVE MATHEMATICS PROGRAM, GRADES 1-12

	RAW SCORES		NCEs		MEAN GAIN
	Pre	Post	Pre	Post	IN NCE
Grade 1 Mean	21	43	27	51	24
N = 77 Median	21	43	27	46	
SESAT LEVEL II					
Grade 2 Mean	31	45	30	36	6
N = 1283 Median	31	45	30	34	
SAT, PRIMARY I					
Grade 3 Mean	44	68	28	35	7
N = 1456 Median	44	68	27	34	
SAT, PRIMARY II					
Grade 4 Mean	36	57	30	38	8
N = 1477 Median	35	57	29	38	
SAT, PRIMARY III					
Grade 5 Mean	41	60	31	36	5
N = 1364 Median	40	60	31	35	
SAT, INTERMEDIATE I					
Grade 6 Mean	43	61	28	37	9
N = 944 Median	42	60	30	37	
SAT, INTERMEDIATE 2					
Grade 7 Mean	36	50	28	37	9
N = 547 Median	35	47	31	38	
SAT, ADVANCED					
Grade 8 Mean	43	56	30	36	6
N = 324 Median	42	53	31	36	
SAT, ADVANCED					
Grade 9 Mean	23	28	33	41	8
N = 287 Median	23	29	34	41	
TASK 1					
Grade 10 Mean	24	29	32	38	6
N = 160 Median	24	30	32	39	
TASK 1					
Grade 11 Mean	15	19	*	*	*
N = 71 Median	15	17	*	*	
TASK 1					
Grade 12 Mean	12	14	18	28	10
N = 6 Median	12	14	19	26	
TASK 2					

*All 11th graders were tested with TASK Level I instead of Level II; appropriate norms have not been produced for 11th graders on Level I (See Page 4.)

III. SUMMARY OF SURVEY DATA AND TEACHER INTERVIEWS

Introduction

A teacher survey provided data from 80 teachers who completed the questionnaire at a group meeting at the end of the school year. The survey was constructed based on responses from the teacher interviews, pretested, and revised by the Office of Education Evaluation (OEE) with assistance from the central Title I Nonpublic School Program administrators.

Interviews conducted with teachers and staff in 12 schools from May 29, 1980 through June 1, 1980 also provided evaluation data. Each site visit included an observation of the Title I instructional program and an interview with the teacher. The sites for the evaluation were selected randomly from a stratified sample of schools in the Title I Corrective Mathematics Program. The interview form was also constructed, pretested, and revised by the Office of Educational Evaluation with assistance from the central Title I Nonpublic School Program administrators. The interviewer was trained in the use of the form by OEE staff and Title I nonpublic school personnel before conducting the interviews. The interviewed teachers were informed that the purpose of the interview was to provide information to the program coordinators and OEE. Teachers were assured that their responses would be reported and stored anonymously. The interviews ranged in length from 40 to 60 minutes; the average interview time was 49 minutes.

Information About Teacher Respondents

Teaching Experience. The survey data indicate that 6% of the 80 teachers had one to five years experience, 45% had six to ten years, 40% had 11 to 15 years, 4% had 16 to 20 years and 5% had more than 20 years teaching experience.

Of the 12 interviewed teachers, 50% had six to ten years teaching experience, 33% had 11 to 15 years experience and 17% had 16 to 20 years experience. No interviewed teacher had less than five years experience.

Teaching Experience in the Title I Corrective Mathematics Program. Of the surveyed teachers who responded to this question, 21% of the teachers indicated that they had one year of experience in the program, 2% had two years experience, 6% had three years, 6% had four years, and 61% had five years or more experience in the Corrective Mathematics Program.

Educational Background. The survey revealed that 9% of the surveyed teachers in the program have a BA/S degree only, 14% have a BA/S degree plus graduate credits and 76% have a MA/S degree.

The interview data show 17% have a BA/S degree plus graduate credits and 83% have a MA/S degree (in elementary education, guidance administration and supervision, history, or math education). Forty percent of those with graduate degrees have taken 30 graduate credits beyond their Masters degree.

Professional Development Activities. The surveyed teachers were asked about the professional development activities in which they had participated during the past three years. Their responses indicated that 65% had earned college credits, 16% had participated in non-Title I Board of Education workshops, 21% had taken UFT courses, all had participated in Title I

workshops, 39% had attended local and national professional conferences, 24% had participated in publisher's material workshops and 24% had taken other non-credit courses.

All of the interviewed teachers indicated that they had participated in the in-service workshops conducted by the Title I Mathematics Coordinator and field supervisors. Other types of professional development activities during the past three years included involvement/attendance at the National Council of Teachers of Mathematics (local and national) meetings, 50%; graduate courses, 50%; special workshops (Cuisinaire or Madison Project workshops), 33%; and self-initiated work, 17%; (one teacher gave workshops during the summer for Great Ideas and another teacher developed a set of charts for Stanford).

Pupil Profile

Number of Students Taught. The surveyed teachers were asked "How many pupils do you teach at all sites where you work?" The average number of students per teacher was approximately 96.

The number of pupils taught by interviewed teachers ranged from 40 to 100. The average number of pupils per teacher was 92. Thirty percent of the interviewed teachers taught at only one site, 33% at two sites, 25% at three sites and 8% at four sites.

Criteria for Selection. The interviewed teachers were asked to identify the criteria for pupil selection in the Corrective Mathematics Program. All of the interviewed teachers indicated that low achievement in reading, residence in the target area, and low achievement in math were criteria for

selection. Other criteria mentioned were limited English-speaking ability (25%)* and teacher recommendations (17%). Teachers indicated that a student with a math disability who did not also have a reading disability was not eligible for the program.

Participant Selection. Teachers in the survey were asked to indicate all those who participated in the selection of children to the program: 95% responded the Title I corrective mathematics teacher, 80% responded the nonpublic school principal, 77% selected the nonpublic school classroom teacher, 36% indicated the guidance counselor, and 21% responded the other Title I teachers.

All of the interviewed teachers said the Title I guidelines were used in the selection of the pupils. Ninety-two percent of the interviewed teachers indicated that they participated in the selection of children for the program. The interviewed teachers also frequently mentioned the school principal (75%), other Title I teachers (75%), guidance counselors (8%), and the Mathematics Coordinator (8%), as people who participated in the selection of pupils.

Clearly, selection of students for the program is a cooperative effort among the Title I teachers (using the Title I guidelines) with the school principal assuming an active role.

Most Common Learning Problems. The survey listed eight learning problems and asked the teachers to identify the three most common to the students they taught. The surveyed teacher responses were as follows: 54%, poor listening skills; 50%, retention skills; 48%, general problems in con-

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* Seventy-five percent of the teachers responded that limited English speaking students were not assigned to a Corrective Mathematics Program while the other 25% indicated that some of their students were limited English speaking. Therefore, it is possible that limited English speaking is not a program criterion of eligibility, but an added factor.

cep. development; 36%, attention problems; 31%, poor self-images (including fear of failure), 29%, behavioral problems; 27%, problems from other achievement areas; and 16%, language problems.

The learning problem most frequently mentioned by the interviewed teachers was reading (75%). Other problems mentioned were poor conceptual abilities (42%); behavioral problems (33%); short attencion span (50%); problems in listening to and following instructions (42%); language problems (33%); anxiety (17%); and problems at home (17%). Some teachers also reported specific problems with content materials such as: difficulty with word problems, difficulty in abstract thinking, and lack of basic mathematics facts.

Teaching Methodology

Major Areas of Focus. Major areas of instructional focus indicated by surveyed teachers were: learning of basic arithmetic facts, 79%; acquisition of computational skills, 79%; increasing problem solving ability, 95%; discovering number relationships, 79%; and forming generalizations, 56%.

All interviewed teachers named the learning of basic arithmetic facts and increasing problem solving ability as the major foci of instruction. Ninety-two percent of these teachers viewed acquisition of computational skills, discovery of number relationships, forming generalizations and fixing learning as the major foci of their instrucion. Other responses included: conceptual development, 25%; geometry, 8%; thinking logically, 8%; and practical arithmetics, 8%.

Time Allocation. Interviewed teachers were asked to estimate the time allocated to various instructional activites. Seventy-five percent of the teachers indicated that they spend between 50% and 75% of their time directing instruction to the entire group of an average of ten pupils. These interviewed teachers usually spent 25% of their time on individualized instruction (including monitoring pupils' work), and 10% of their time in formal and informal diagnosis. No interviewed teacher spent more than 10% of the time in discipline and housekeeping duties.

Motivation. The surveyed teachers were asked to identify the methods or techniques they used to motivate students; 91.2% checked games, 83.8% reported using manipulatives, 56.2% checked reward systems (stars, stamps, etc.), 36.2% indicated pupil self-evaluative techniques and 25% reported graphs for self tracking. The survey also asked the teacher respondents to check the two most obvious pupil behavioral changes that resulted from the increased motivation. The responses were: 64%, more participation in Title I classroom activities; 39%, willingness to try more difficult materials; 39%, better self-image; 25%, greater rapport with the teacher; 23%, more attentive; and 16%, undertaking independent work.

All of the interviewed teachers indicated the use of games and/or manipulative-type materials as motivational techniques. The interviewed teachers also noted that students have trouble sitting still; it is, therefore, important that the students be involved in activities that allow for movement. Some movement activities were a classroom store, drawing pictures, and making pancakes as a way of dealing with fractions. Forty-two percent of the interviewed teachers tried to coordinate learning objectives with real-life problems, stores and questions. Seventeen percent used a reward

system (stars/stickers) as a motivational tool. Sixty-seven percent indicated that positive changes had occurred in the students' attitudes toward mathematics. Specifically, students were eager to come to class, they requested extra work, they became more confident in their abilities, and their self-image improved. In addition, 42% of the teachers reported a decrease in discipline problems and 25% reported an increase in class participation.

Peer Tutoring, Independent Study and Individualized Instruction. Forty-six percent of the surveyed teachers indicated their students were involved in peer tutoring and 64% indicated that their students were involved in independent study activities.

During the interviews, 67% of the interviewed teachers indicated their students were involved in some form of peer tutoring. This generally took the form of one child who had mastered a topic helping another child with related work. Eighty-three percent reported that their students participated in self-evaluation activities by checking their own work and answers. All but one of the interviewed teachers indicated their students participated in independent study. Twenty-five percent reported their students did independent study in the form of homework assignments, another 25% reported that they would give an independent study assignment to individuals who were performing at a level different from the rest of the class, and 33% said they sometimes gave students work to do indepentently such as math games, ditto sheets and puzzles. Only one interviewed teacher indicated that children were involved in longer term independent study activities involving several days work on a topic or project.

Pupil Assessment. Surveyed teachers were asked to specify items they used to assess their students' academic abilities at the beginning of a year and during the year. The following table summarizes their responses.

TABLE 1

Techniques used by Teachers (in percentages) to Assess Pupil Achievement at the Beginning and During The Year

Type of Assessment	Beginning of Year	During Year
Title I Program Assessment	19%	9%
An Informal Reading Test	2%	2%
A Standardized Norm Referenced Test	90%	60%
A Standardized Criterion Referenced Test	7%	26%
Teacher-Made Criterion Referenced Test	10%	26%
Conference with Classroom Teacher	20%	27%
An Informal Mathematics Test	20%	0%
Classroom Observation	0%	40%

Surveyed teachers were asked to name their two major uses of the results of the initial assessment: 65% mentioned evaluation of progress; 49%, individualization of instruction; 40%, organization of group work; lesson plans; 6%, teacher self evaluation and 2% indicated using the results of the assessment for diagnostic purposes.

All interviewed teachers indicated that they gave the Stanford Achievement Test for initial diagnosis and assessment of the students' achievement in mathematics. Fifty percent of the interviewed teachers also used teacher made instruments (criterion referenced tests). In addition, the interviewed

teachers said they used the regular classroom teachers' recommendations as part of their initial and on-going assessments.

Interviewed teachers used the initial pupil assessment as a basic tool for long range planning and for organizing the students in groups. The majority of the interviewed teachers, 83%, also reported using this preliminary testing for individualizing instruction.

Half of the interviewed teachers stated that the Stanford Achievement Test was not an adeuqate diagnostic instrument because it was a multiple choice test. These teachers felt the students had an advantage because they could guess correct answers to questions on skills they had not yet mastered.

Eighty-three percent of the interviewed teachers indicated that they used the Spring, 1980, administration of the Stanford Achievement Test to reassess students' achievement. In addition, all of the interviewed teachers gave some type of teacher-made test, usually at the completion of a unit. All the interviewed teachers said that their primary method of reassessment was by observation of daily work; and they keep formal records of the skills the student has mastered. All interviewed teachers meet with the regular classroom teacher for additional information for reassessing pupils.

All of the interviewed teachers felt the informal and formal reassessments were important in the evaluation of each student's progress. Sixty-seven percent of the interviewed teachers responded that on-going reassessments helped them to individualized instruction; 67% reported that it aided in organizing group work and 50% used the assessments for short and long range planning. Additional responses were to provide input to parents, feedback to pupils, information for pupil self evaluations, and data to compare with the assessments made by the regular classroom teacher.

Student Records. All interviewed teachers kept records of attendance test scores, pupils' progress, students' work, a checklist of skill mastery for each student, a record of classroom teacher conferences and notes from their meetings with the nonpublic school principals. Other records included progress reports, records of conferences with other Title I teachers and pupil related correspondence.

Related Duties. All of the interviewed teachers indentified the following areas as duties related to teaching: administering standardized tests, diagnosing pupil needs, implementing instruction, participating in in-service conferences, preparing and maintaining lesson plans and pupil records, and confering with parents. Other responses included: preparing instructional materials, organizing classrooms, conferring with teachers and the principal, preparing progress reports, listening to student problems, helping with regular classroom mathematics, and planning the schedules.

Materials. All interviewed teachers found the materials to be appropriate for the pupils they taught. Teachers indicated that commercial materials were helpful and indicated a desire for additional ones.

All of the teachers indicated that the Title I Corrective Mathematics supervisory staff selected the materials they used in their classroom. However, 75% of the teachers said that they had some input into the selection decisions because they could recommend materials.

Support Services

Clinical and Guidance. The survey asked teachers to identify those staff members who referred pupils for clinical and guidance services; 91% checked the Title I Corrective Mathematics teacher; 85%, other Title I nonpublic school teachers; 83% classroom teachers; 75%, principals; and 27%, parents. Nineteen percent of the survey respondents judged these services to

be extremely effective; 26%, very effective; 39%, somewhat effective; 1%, not at all effective; and 9% indicated they did not know.

During interviews, all of the teachers said they referred children to guidance services. Other responses included were: recommendations from the regular classroom teachers (67%), other Title I teachers (42%), the principals (17%), and parents (8%).

The interviewed teachers had varying responses about the effectiveness of the clinical and guidance services. Twenty-five percent of the interviewed teachers felt that guidance services were extremely effective; 8%, very effective; 8%, effective; 42%, somewhat effective; and 8%, not effective at all. The predominant opinion was that effectiveness of the guidance services varied in quality from school, dependent on the specific guidance counselor.

Title I Central Staff. The survey asked teachers to indicate support services provided by the Title I Corrective Mathematic supervisory staff. The surveyed teachers noted supervisory visits, instructional supplies and audio-visual equipment.

All of the interviewed teachers indicated the Title I Corrective Mathematics supervisory staff supplied instructional materials, made supervisory visits, provided reference materials, made available audio-visual equipment, and conducted workshops.

Nonpublic School Principal. Eighty-five percent of the surveyed teachers responding to the questionnaire indicated that the nonpublic school principal provided orientation to school procedures. Sixty-two percent reported the principal arranged scheduling, 18% indicated the principal held monthly conferences and 16% checked that the principal arranged conferences with the regular classroom teachers. Most of the teachers interviewed found the principals to be cooperative and available when necessary.

Eighty-three percent of the interviewed teachers reported that the principal encouraged coordination with the regular classroom teacher. Sixty-seven percent indicated that the principal also provided support in the areas of orientation to the school scheduling and pupil related conferences.

Parent Contact.

Number of Frequency. The data indicated that surveyed teachers met an average of 32% of the parents. Teachers reported seeing some parents on a continuous basis, either weekly or monthly.

Interviews revealed that those teachers met with a range of 7% to 61%* of the parents of all the students they taught (See Table 2). The mean number of parents met per teacher was 30 (the range was from seven to 59). Thirty-three percent of the interviewed teachers had met with less than 25 of the parents (range for parents: 7%-20%); 42 with between 25 and 50 of the parents (25%-44%); 25% with more than half of the parents (51%-61%). No interviewed teacher met with more than 61% of their students' parents.

The number of parents met at each classroom site (see Table 2) ranges from zero to 59. The average number of parents met at any one classroom site was 14. Forty-four percent of the classroom sites in the sample had contact with less than 25 of the parents (0%-23% range); 40% of the classrooms in the sample had contact with 25% to 50% of the parents, and 16% had contact with more than 50 (52%-75% range). No classroom site had contact with more than 75% of the parents.

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* This figure is based on the total number of parents for all sites that each teacher serviced.

The interviewed teachers indicated that most of the meetings occurred informally either before or after school. The teachers noted that they had met 10% or fewer of the parents in a formal manner. Contact with parents seemed to be dependent on the proximity of the school to the home address. Contact was high when students walked to school and low when students were bussed in from far away. The interviewed teachers said that since most parents work, they are often unable to meet with their children's teachers.

TABLE 2

Percentage of Parents Met by Each Interviewed Teacher by Each School Site

SCHOOLS	TWELVE INTERVIEWED TEACHERS											
	1	2	3	4	5	6	7	8	9	10	11	12
School I												
Pupils Taught	40	40	60	96	19	62	26	100	20	82	43	60
Parents Met	13	5	10	59	3	18	5	25	8	50	10	45
Percentage	33%	13%	17%	61%	16%	29%	19%	25%	40%	61%	23%	75%
School II												
Pupils Taught	40	40		59	40	56			21		43	36
Parents Met	8	10		2	12	20			11		4	10
Percentage	20%	25%		3%	30%	36%			52%		9%	28%
School III												
Pupils Taught	19				20				40		19	
Parents Met	3				2				20		0	
Percentage	16%				10%				50%		0%	
School IV												
Pupils Taught									20			
Parents Met									5			
Percentage									25%			
Totals												
Pupils	40	99	100	96	98	102	82	100	101	82	105	96
Parents Met	13	16	20	59	7	30	25	25	44	50	14	55
Percentage	33%	16%	20%	61%	7%	29%	30%	25%	44%	61%	13%	57%

Only 16% of the interviewed teachers reported daily meetings with any parents; when this contact did occur it was informal (on the street, before or after school). An additional 33% of the teachers saw some parents informally on a weekly basis. Eighty-three percent of the interviewed teachers indicated contact with some parents every reporting period, 58% on a monthly basis, and 100% reported seeing some parents on a yearly basis (both formally and informally). (See Table 3.)

TABLE 3

Frequency of Parent Contact by Each Interviewed Teacher

	TWELVE INTERVIEWED TEACHERS											
	1	2	3	4	5	6	7	8	9	10	11	12
Number of Parents Met	13	16	20	59	7	30	25	25	44	44	14	55
# seen daily	0	0	*	0	0	0	0	0	0	30	0	0
% seen weekly	50	0	*	50	0	3	0	0	0	30	0	50
% seen monthly	50	0	100	75	0	3	0	0	0	30	20	50
% seen every reported period	30	100	20	100	100	5	0	100	100	95	50	0
% seen yearly	100	100	100	100	100	100	100	100	100	100	100	100

Method. According to the survey, the most commonly reported means of communicating with parents was face-to-face (80%). Other means reported were by telephone (22%), by written communication (20%), and by parent/tutorial workshops (35%).

* Missing data

Interviewed teachers were also asked about the ways they communicated with parents. All of the teachers reported face-to-face meetings. Other methods included by telephone (83%), written communications (including written progress reports), and form letters.

Initiation. Seventy-nine percent of the survey respondents indicated that the Title I corrective mathematics teacher initiated the majority of teacher-parent contacts; 15% named the parents and 1% indicated the regular classroom teacher.

Ninety-two percent of the interviewed teachers identified the Title I teacher as initiating the parent-teacher contact. Eighty-three precent of the interviewed teachers stated that some of the parents also made the initial contact. Other reported responses included the classroom teacher (50%), pupils (33%), guidance counselors (17%), and principals (8%).

Classroom and Home Involvement. Ninety-two percent of the interviewed teachers reported having individual conferences with parents to discuss the students' progress. Over half of the interviewed teachers (58%) indicated that parents came to the classroom to observe. Again, the interviewed teachers reported that inadequate transportation for parents to the school hindered parental involvement activities. It was also reported that some parents had full time job obligations or were unable to help their child (e.g., because of language difficulties).

Teachers also reported ongoing articulation and communication with parents, both through homework assignments and through parental involvement in game playing and math activities.

Major Concern of Parents. According to the survey, teachers feel the major concern of parents was whether their children were performing on grade level.

All of the interviewed teachers indicated that the primary concern of the parents was their children's progress. Other major parental concerns, as assessed by interviewed teachers, included having their children reach grade level performance (58%) and whether or not the child would be promoted (50%). Other reported parental concerns included: behavior in the classroom (17%): other services available to the child (8%); how they as parents can help their child's achievement (8%); and removing the child from the regular classroom to attend Title I classes (8%).

Recommendations

Survey Results. The survey listed seven recommendations and asked teachers to check the one they considered most important. The results were:

- 36% - More teacher involvement in materials selection
- 33% - Fewer students seen more often
- 18% - More workshops based on Title I teacher input (re: teaching techniques)
- 5% - More opportunity for coordination with the classroom teachers
- 2% - No significant improvement is required
- 1% - More opportunity for coordination with the guidance counselor
- 1% - More opportunity for coordination with other Title I personnel

General. General recommendations suggested by the interviewed teachers included: increase the frequency of instruction from twice a week to three to five times per week (33%); decrease group size to permit more individualized attention (25%); more teacher involvement in materials select-

ion (25%); more teacher exchange workshops (17%); change in the student eligibility rules so that those who are poor in math, but good readers can be included in the Corrective Mathematics Program, (8%); and increase guidance services (8%).

Staff Development. The most common recommendation was to have more workshops. Some suggestions for these workshops included a course on learning disabilities, making your own materials and model lessons. Other recommendations included more teacher-to teacher exhanges, and more teacher intervisitions.

Para-professional. Several interviewed teachers indicated that they would like to have a para-professional to help with individual pupils. All of the interviewed teachers with para-professional aides were very pleased with them.

It should be noted that para-professionals are employees of decentralized programs and as such are hired, supervised, and evaluated by community school district staff.

Para-professional staff when assigned by community school disticts will, under the guidance of the Title I teacher: (1) work with the selected pupils on a one-to-one or small group basis on specifically planned activities geared to foster skills as diagnosed and taught by the Title I teacher; (2) assist with preparation of materials; and (3) assist with clerical and housekeeping tasks.

Pupil Selection. Seventy-five percent of the interviewed teachers recommended that students be placed in the program on the basis of their math disability only. Presently, the students must initially show disability in reading before becoming eligible for the Corrective Mathematics Program.

Coordination with the Regular Classroom Teacher. The Title I teacher confers periodically with the nonpublic school classroom teacher to ascertain the specific needs and weaknessess of the assigned pupils. Evaluation of pupil achievement and progress reports are reviewed with nonpublic school staff. Several interviewed teachers recommended more communication with the classroom teacher. Constitutional limitation and judicial decisions determine the extent to which Title I staff are involved in the nonpublic school instructional program.

Coordination with other Nonpublic School Title I Program Staff. Several interviewed teachers indicated that communication is a problem because the days the different teachers are at the same site do not always overlap.

III. CLASSROOM OBSERVATION SUMMARY

Introduction

At each of the 12 sites visited, classroom observations were made the same day as the teacher interview. The classroom observation usually took two and one-half hours. Fifty percent of the observations were made in the morning and 50% in the afternoon.

Classroom Characteristics

Ten of the 12 classrooms were adequate in the categories of lighting, physical orderliness, space, ventilation, flexibility and freedom from external noise. Many of the classrooms were large and sunny and permitted an extensive display of teaching materials and student work. Of the classrooms found inadequate, one was on a poorly lit stage with poor ventilation. The space was shared with the reading teacher and thus provided little roon for math displays and/or math assignments. The other class met in the library, and that library was quite crowded. There seemed to be little blackboard space, and the math materials, although sufficient, were not readily accessible.

General Observations

A typical lesson was divided into three activities: (1) a game providing drill on a previously learned skill or the topic of the day; (2) a development lesson during which the teacher introduced a topic, many of these lessons included the use of manipulatives; and (3) a follow-up activity involving a pencil and paper task at which time the teacher provided for individual needs by circulating from child to child.

Teachers gave students immediate oral feedback through the lessons observed. Some teachers guided the children in discovering the algorithm while others tended to tell the children the process they should use. Developmental lessons in all classes included dialogue between the teacher and the students; there were no lecture classes.

Seventy-five percent of the teachers used manipulative materials during the observation period. Eighty-three percent of the teachers used games to reinforce and teach skills. All of the surveyed teachers used games and/or manipulatives. This observation is in keeping with the teacher interviews as well as the survey responses indicating that 91% of the teachers reporting using games and 84% reported using manipulatives. Twenty-five percent of the surveyed teachers used a discovery-type approach in their lessons and utilized a written or oral drill to reinforce skills. In addition, visual aids were observed in 17% of the classrooms.

Classroom Observation Checklist. Teacher

Other observations listed in Table 4, include the following: 92% of the teachers encourage children who work independently; one teacher insisted on group participation (8%). Ninety-two percent encouraged the children to work together; one teacher had prepared individual assignments for each child and did not encourage conversation among the pupils (8%). There were no social problems evident in any of the classrooms. Therefore, there was no opportunity to observe teachers solving social problems. All of the teachers worked with the children, talked to them about their activities, helped children solve academic problems and encouraged children in

their work. Twenty-five percent of the teachers were involved in pupil diagnosis/prescription during the observation period.

TABLE 4

Classroom Observation Checklist: Teacher

ACTIVITIES	# OBSERVED
Encourages children to work independently	92%
Encourages children to work together	92%
Talks with children about their activities for the instruction period	100%
Works along with children	100%
Helps children solve academic problems	100%
Helps children solve social problems	42%
Encourages/reinforces children in their work	100%
Gives feedback to children on their progress	83%
Pupil diagnosis/prescription	25%
General discussions with pupil(s)	0%
Individual pupil conference	0%

Classroom Observation Checklist: Children

Observations of the children were also made and summarized in Table 5. Children's work was visibly displayed in all classrooms. There were no classes in which groups of children worked independently or decided what activity they would engage in. Children spent time working independently in 83% of the classrooms.

TABLE 5

Classroom Observation Checklist: Children

ACTIVITIES	# CLASSROOMS OBSERVED
Work independently	83%
Work in small group independent of teacher	0%
Children decide what they will do (their plan is not limited to specific teacher conceived activities)	0%
Children's work is visibily displayed in classroom	100%

IV. SUMMARY OF INTERVIEWS WITH PROGRAMS COORDINATOR AND FIELD SUPERVISOR

Introduction

This section provides a summary of two separate interviews, one with the program coordinator and the other with the field supervisor. Both people have been involved with the program for 14 years. The program coordinator has been in that position for the entire 14 years and the field supervisor was a teacher in the program for five and one-half years and has served as the field supervisor for the past eight and one-half years.

Program Considerations

Goals. The primary goal of the program is to improve the mathmetical ability of those children with diagnosed weaknesses in the areas of computation, mathematical concepts, and problem solving. The coordinator suggested that a hidden goal is to improve the children's attitude toward mathematics by creating an interest, eliminating fears and developing an appreciation of the idea that math is all around us.

In 1966, when the program began, the stated goal was to bring the children up to grade level. As the program evolved, it was discovered that the children had to be motivated and thus the hidden goal was conceived -- to develop an interest and appreciation of mathematics. These goals were established by the program coordinator.

Strengths and Needs. The strengths of the program are centered in the small group size and the opportunity for individual attention; the supervisor added that the dedication and training of the staff was an asset; and the coordinator also emphasized the teachers' training in elementary

mathmetics. The coordinator pointed to the need for adequate time and space for staff development. The coordinator also suggested a special certification category for teachers of corrective mathematics. No changes are presently anticipated; the program will continue as currently formulated.

Purpose of Program Assessment. The coordinator said that program assessments served for future planning and adjustment in the program as well as changes in teaching methodology. The supervisor added that the pupil assessments helped to gear the program toward the actual need of the individual child.

Instructional Considerations

Approaches to Instruction. The use of games and concrete manipulatives were emphasized. The coordinator focussed on the use of technological developments such as computers and calculators. The supervisor mentioned an eclectic approach (audio-visual, manipulative, and the like) and a problem-solving approach using the various computational techniques.

Daily Lesson. The supervisor outlined a standard lesson plan format consisting of a review of prerequiste skills, followed by a drill on the new or previous topics, a motivational activity presented as a question or a problem, and the lesson development. The final goal is to have the students apply their understanding of a particular concept or skill to the mastery of a new concept or skill.

Motivation. The coordinator and supervisor stressed that the use of colorful materials, a hands-on approach to learning arithmetic concepts, and the application of mathematics to everyday situations encountered by the child

were the primary motivational techniques. No one textbook is prescribed, however, several textbook series are provided for teacher reference.

Overlap Between What is Taught and What is Tested. The corrective mathematics instructional objectives are more comprehensive than those measured by a standardized test. The coordinator stated that the instruction is based on weaknesses revealed by the pretest. The supervisor stated that teachers use the New York City's Scope and Sequence, and Minimal Teaching Essentials and other New York City Board of Education publications.

Introduction of New Ideas/Approaches/Topics. The coordinator noted that during the last three years there has been an increase use of calculators as well as an increased emphasis on geometry at the elementary school level. The supervisor pointed out the new emphasis on the metric system. She also noted an emphasis toward a sensory (auditory, visual tactile) approach to instruction. The coordination of reading and math skills was also mentioned by the supervisor.

New ideas/topics/approaches are developed by the coordinator and the supervisor. The supervisor emphasized that they kept abreast of the newest methods and endeavored to adapt these to the Corrective Mathematics Program's teachers' and pupils' needs. New ideas/topics/approaches are taught to teachers during in-service workshops.

Student Considerations

Reporting of Students' Progress. The teachers discuss progress with the students daily. The supervisor reported that each student has a folder containing all of his work. The teacher also discusses the bi-yearly progress report with the student.

The parent receives two written progress reports on the child during the year. The supervisor added that parents are able to discuss their child's progress during formal and informal contacts with teachers at parent workshops.

The school principal is given a copy of each child's September and May Stanford Achievement Test scores. The supervisor also indicated that teachers maintain an on-going dialogue with the principal.

Retention of Students. Retention in the program was determined by two criteria; remaining on the eligibility list and failure to reach grade level performance.

Personnel Considerations

Supervisory Staff's Responsibilities. Informal field visits are made by the field supervisor to each teacher based on individual needs. A formal observation is made and forms the basis for a written report. Recommendations concerning teacher performance are discussed during post-observation conferences and through follow-up visits.

The supervisor mentioned that all supervisors and coordinators meet throughout the year and exchange input on the various Title I nonpublic school programs. The coordinator said that a supervisor might occasionally stop in to see teachers in other Title I programs in order to maintain inter-program communications.

Program Changes and Development. New methodologies and materials are first discussed at the supervisory level and then presented to teachers at workshops. Small groups of teachers are then asked to try the new methodology or materials for possible program-wide implementation.

Strengths and Needs of Instructional Staff. The coordinator and supervisor stressed the dedication of the teachers to the program, their qualifications, knowledge of the subject manner and their empathy for the children as the major strengths of the teaching staff.

In order to strengthen the instructional staff, the supervisor suggested the possibility of requiring an MA degree in remedial mathematics education for all future teachers. The coordinator stressed the need for a designated central program location and more time for staff training.

Recommendations

General. Both the coordinator and the supervisor stressed that pupils should be selected based on the mathematics disability alone and should allow inclusion of children with good reading skills who are deficient in mathematics skills.

Staff Development. The coordinator suggested requiring special certificiation for Corrective Mathematics teachers. The coordinator also recommended making videotapes of master teachers available as a resource for the staff.

Materials. Both the supervisor and the coordinator stressed the importance of keeping abreast of new materials and adapting "useful" materials for the program.

Coordination with the Central Title I Program Staff. Both the coordinator and the supervisor felt that all Title I central staff work very closely together. No recommendations were made.

VI. EVALUATION CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Analysis of the pre-and posttest data for corrective mathematics students indicates that the program had significant educational impact on pupils' mathematics achievement. The most striking gain in scores occured in grade 1, where the average NCE gain was 24. This finding is worthy of further investigation. A major issue to address is: Are there specific instructional variables accounting for this gain? If specific instructional variables can be indentified, the likelihood that they will be implemented in the following years will be increased.

Observations of classrooms revealed that teachers were implementing the program according to its guidelines. Furthermore, children were engaged in their lessons; all teachers provided encouragement and reinforcement to children at work.

Recommendations

Corrective mathematics teachers offered the following recommendations for program improvement: 1) fewer students seen more often, 2) greater involvement in materials selections, 3) more workshops including a course on learning disabilities, making materials, and model lessons. In addition, 50% of the interviewed teachers felt that the Stanford Achievement Test was not an adequate diagnostic instrument, because the test items are multiple choice and hence, gave the student an opportunity to guess the correct answer. The evaluation team cannot fully assess the feasibility or desirability of implementing all of these recommendations. However, we do suggest

that the program coordinator discuss these issues with teachers at staff meetings or during field visits.

One problem mentioned by both teachers and supervisors was the state mandated criteria for pupil selection. Pupils are selected for participation only if they are below grade level in reading as well as mathematics. Furthermore, 75% of the interviewed teachers mentioned that poor reading ability was one of the most common learning problems of their students. The evaluation team supports the program staff's concern with this issue.

An administrative practice worthy of praise is the manner in which instructional materials are selected for use. The materials are piloted on a sample of teachers to obtain their feedback before the material is considered for distribution system wide. We suggest that this practice be adopted in the other program components. In addition, the program coordinator recommended that video tapes be made of master teachers as a resource for the staff. Implementation of this suggestion would help to satisfy the teachers' desires for workshops focused on model lessons. Furthermore, it may cut down on the time needed for teacher intervisitations.

Finally the evaluation staff recommends that the effect of the tutor computer and the parent tutorial program be examined to determine the impact on pupil mathematics achievement.